UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6563

CSAH 7

OVER THE

ZUMBRO RIVER

DISTRICT 6 - WABASHA COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO.5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected below water at Bridge No. 6563, Pier 1, was found to be in fair condition. The top of the footing was exposed around the entire perimeter of the pier with full vertical footing exposure and up to 1 foot of undermining along the upstream nose, all of the eastern face, and along portions of the west face of the pier, exposing the timber bearing piles. In addition, a heavy accumulation of timber debris was located at the upstream nose of the pier that also extended along the eastern face of the pier.

INSPECTION FINDINGS:

(A) The top of the footing was located 5.2 feet below the waterline and was exposed around the entire perimeter of the pier. The full vertical height of the footing was exposed along the upstream nose, all of the eastern face, and along portions of the west face of the pier with undermining along those portions of the pier that was up to 1 foot high with up to 1.5 feet of horizontal penetration. The exposed timber piles along the undermined areas were all in good condition.

(B) A heavy accumulation of timber debris consisting of 1-foot-diameter and smaller logs and branches was observed at the upstream nose of Pier 1 and also extended along the east face. The debris extended from the channel bottom up to 1 foot above the waterline.

(C) Moderate scaling was observed along the pier shaft with penetrations ranging from 1/4 inch to 1/2 inch deep.

(D) Heavy scaling was observed along the exposed footing with penetrations ranging from 1/2 inch to 1 inch deep.

RECOMMENDATIONS:

(A) The heavy accumulation of timber debris should be removed during routine maintenance.

(B) The exposed footing and undermining observed at Pier 1 should be evaluated with respect to the scour potential and structural stability of the pier. Based on that analysis either scour counter measures may be necessary, or as a minimum, the conditions should be monitored during future inspections and after periods of high flow and/or high water levels.

(C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 6563

Feature Crossed: Zumbro River

Feature Carried: CSAH 7

Location: District 6 – Wabasha County

Bridge Description: The superstructure consists of four spans of multiple steel stringers and a steel through-truss supporting the main span, all of which support a reinforced concrete deck. The bridge is supported by three reinforced concrete piers and two reinforced concrete abutments. The piers are numbered 1 through 3 starting from the west to east.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 24, 2007

Weather Conditions: Sunny, ± 58^{o} F

Underwater Visibility: ± 0.5 Foot

Waterway Velocity: ± 3.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1.

General Shape: Oblong rectangular shaft (three rectangular sections connected by web walls) with a pointed upstream end and a square downstream end and is supported by a concrete footing (that generally follows the shaft shape) that is founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 10.7 feet at Pier 1.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the south end of Pier 1.

Water Surface: The waterline was approximately 18.2 feet below reference. Waterline Elevation = 81.8.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 4

Item 92B: Underwater Inspection: Code B/10/07

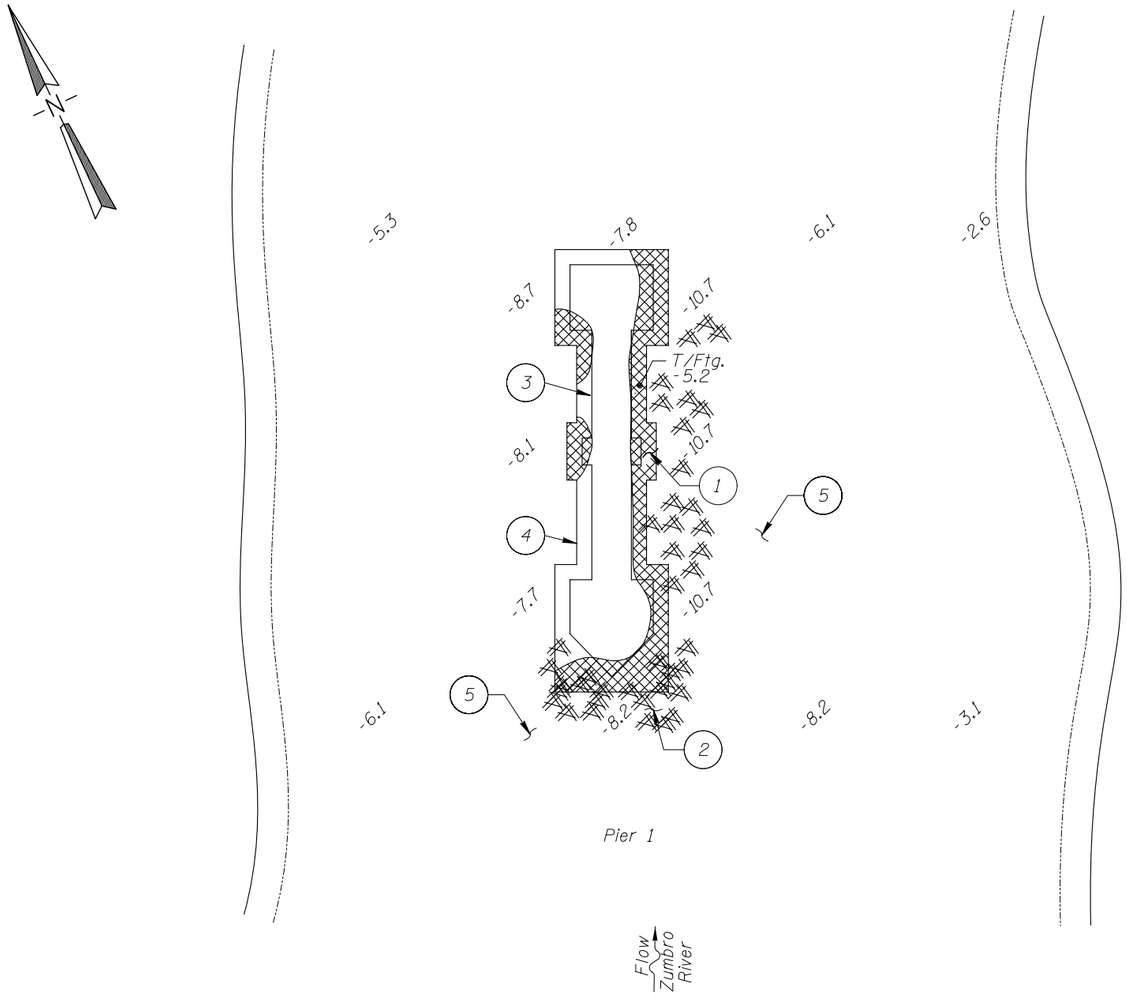
Item 113: Scour Critical Bridges: Code I/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No

Photograph 1. Overall View of Bridge, Looking Southeast.

Photograph 2. View of Pier 1, Looking Southeast.



INSPECTION NOTES:

1. *The top of the footing was located 5.2 feet below the waterline and was exposed around the entire perimeter of the pier. The full vertical height of the footing was exposed along the upstream nose, the entire eastern face, and portions of the western face of the pier with undermining along those sections of the pier that was up to 1 foot high with up to 1.5 feet of horizontal penetration. The exposed timber piles within the undermining were in good condition.*
2. *A heavy accumulation of timber debris consisting of 1-foot-diameter and smaller logs and branches was observed at the upstream nose and also extended along the east face of the pier from the channel bottom up to 1 foot above the waterline.*
3. *Moderate scaling was observed along the pier shaft with penetrations ranging from 1/4 inch to 1/2 inch deep.*
4. *Heavy scaling was observed along the footing with penetrations ranging from 1/2 inch to 1 inch deep.*
5. *The channel bottom consisted of firm rock with no probe rod penetration and large pieces of riprap (3 feet diameter and smaller) were observed at the upstream nose of the pier.*

GENERAL NOTES:

1. *Pier 1 was inspected underwater.*
2. *At the time of inspection, on October 24, 2007, the waterline was located approximately 18.2 feet below the top of Pier 1 on the upstream end. Since insufficant bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference, the waterline elevation was 81.8.*
3. *Soundings indicate the water depth at the time of inspection and are measured in feet.*
4. *Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.*

Legend

-0.4	*Sounding Depth (10/24/07)*
	Timber Debris
	Footing Undermining

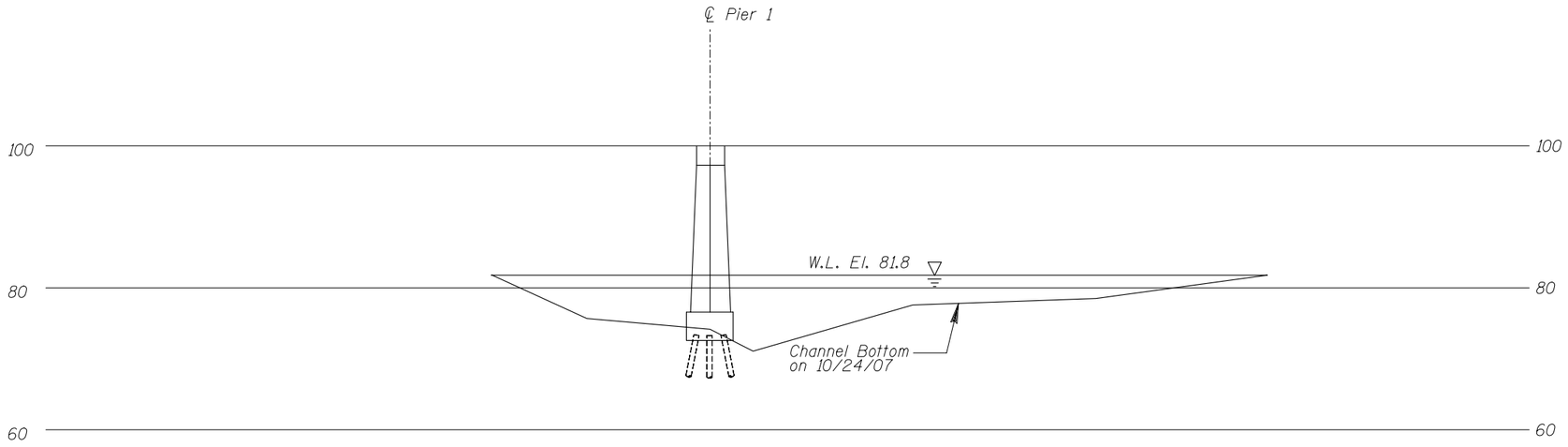
MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 6563
OVER ZUMBRO RIVER
DISTRICT 6, WABASHA COUNTY

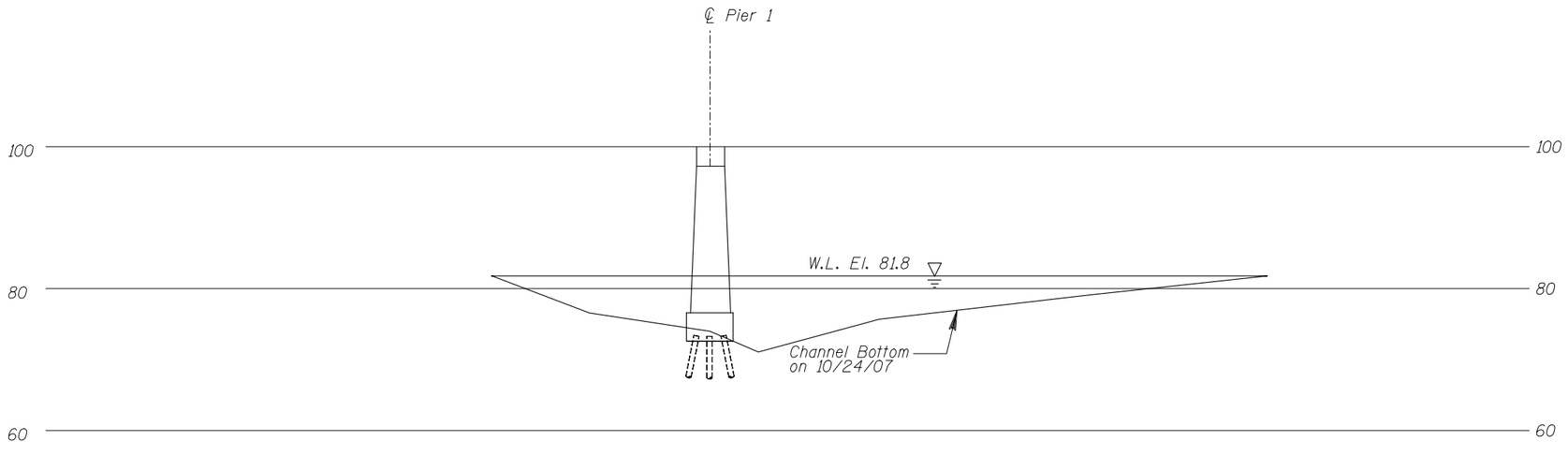
INSPECTION AND SOUNDING PLAN

Drawn By: TWR	COLLINS ENGINEERS, INC 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: DGS		Scale: NTS
Code: 52216563		Figure No.: 1

℄ Brg. East Abutment



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 6563
OVER THE ZUMBRO RIVER
DISTRICT 6, WABASHA COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: TWR	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: DGS		Scale: 1"=20'
Code: 52216563		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 24, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 6563 WEATHER: Sunny, ± 58° F
WATERWAY CROSSED: Zumbro River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Clayton G. Brookins, Valerie Roustan
EQUIPMENT: Scuba,U/W Light,Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 11:30 A.M.
TIME OUT OF WATER: 12:30 P.M.
WATERWAY DATA: VELOCITY ± 3 f.p.s
VISIBILITY ± 0.5 feet
DEPTH 10.7 feet maximum at Pier 1.
ELEMENTS INSPECTED: Pier 1
REMARKS: The top of the footing was exposed around the entire perimeter of the pier. In addition, the full height of the footing was exposed along the upstream nose, the entire east face, and portions of the west face of the pier with undermining along those sections of the pier that was up to 1 foot high with up to 1.5 feet of horizontal penetration, which exposed numerous of the timber bearing piles along the footing perimeter. A heavy accumulation of timber debris was noted at the upstream nose and also extended along the east face of the pier from the channel bottom up to 1 foot above the waterline. Moderate to heavy scaling was noted on the pier shaft and footing, respectively with penetrations ranging from 1/4 inch to 1 inch deep.

FURTHER ACTION NEEDED: X YES _____ NO

The heavy accumulation of timber debris should be removed during routine maintenance.

FURTHER ACTION NEEDED CONTINUED:

The exposed footing and undermining observed at Pier 1 should be evaluated with respect to the scour potential and structural stability of the pier. Based on that analysis either scour counter measures may be necessary, or as a minimum, the conditions should be monitored during future inspections and after periods of high flow and/or high water levels.

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Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6563
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED The Zumbro River

INSPECTION DATE October 24, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	10.7	7	7	6	9	N	6	4	7	7	6	4	6	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The top of the footing was exposed around the entire perimeter of the pier. In addition, the full height of the footing was exposed along the upstream nose, the entire east face, and portions of the west face of the pier with undermining along those sections of the pier that was up to 1 foot high with up to 1.5 feet of horizontal penetration, which exposed numerous of the timber bearing piles along the footing perimeter. A heavy accumulation of timber debris was noted at the upstream nose and also extended along the east face of the pier from the channel bottom up to 1 foot above the waterline. Moderate to heavy scaling was noted on the pier shaft and footing, respectively with penetrations ranging from 1/4 inch to 1 inch deep.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.